

The Arctos Ecosystem: Linking Preserved and Living Collections in the Extended Specimen Network

Michelle S. Koo ¹
Mariel Campbell ², Elizabeth Wommack ³, Andrew Doll ⁴
& the Arctos Working Group

- 1 Museum of Vertebrate Zoology, University of California Berkeley
- 2 Museum of Southwestern Biology, University of New Mexico Albuquerque
- 3 Museum of Vertebrates, University of Wyoming Laramie
- 4 Denver Museum of Nature & Science, Denver, CO



Website: <https://arctosdb.org>
Search: <https://arctos.database.museum>

The Arctos Ecosystem:

Arctos is both a community AND collection management software



Website: <https://arctosdb.org>
Search: <https://arctosdatabase.museum>

The Extended Specimen Network:

“A powerful new source of knowledge to address national priorities”

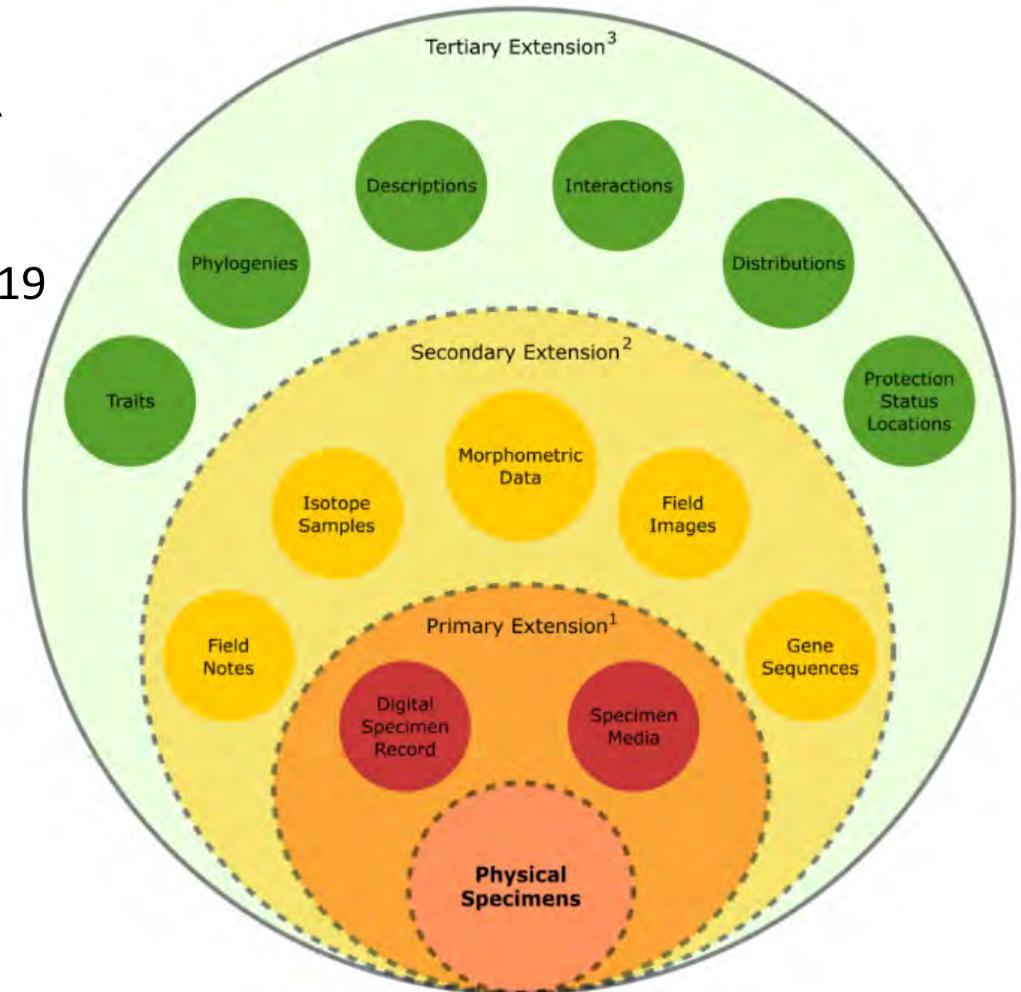
From

Extending U.S. Biodiversity Collections to Promote Research and Education

Thiers et al. 2019

**Extended specimen =
physical specimen**

- + physical specimen data
- + molecular data
- + phenotypic data
- + environmental data



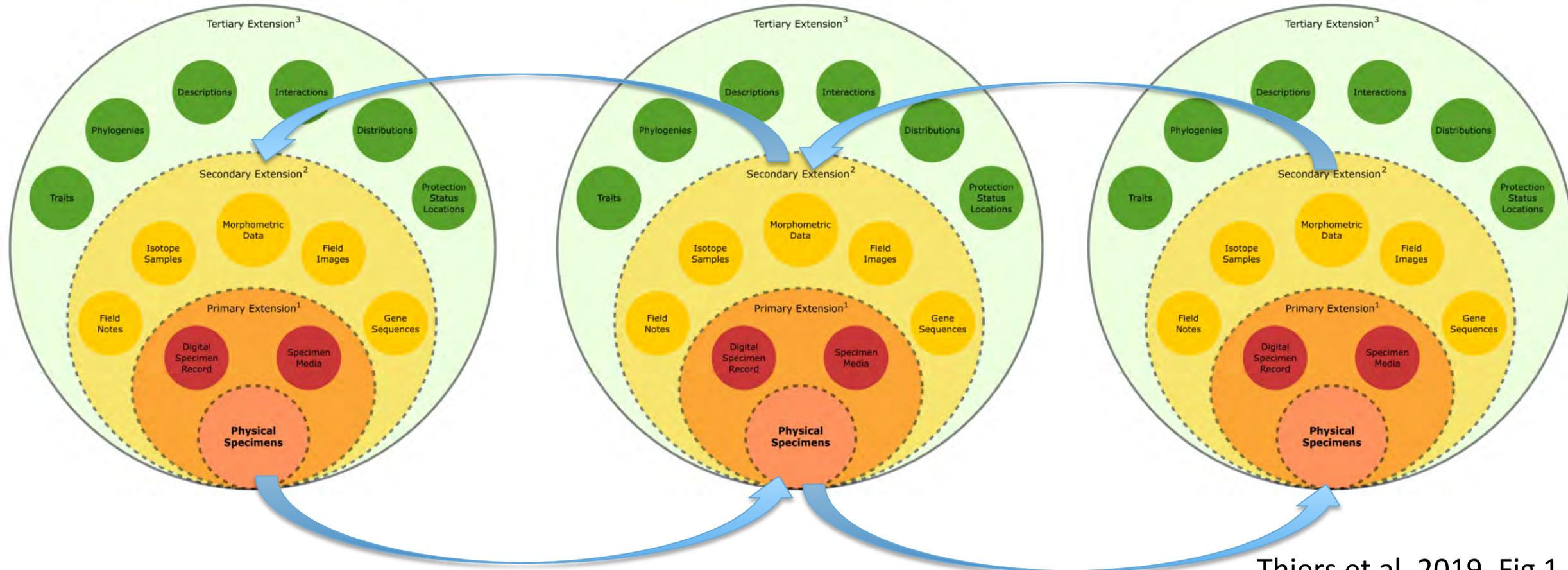
Thiers et al. 2019, Fig 1

Arctos Extended Specimen Network:

“A powerful new source of knowledge to address national priorities”



**Extended specimen *network of networks* =
Linking across collections, institutions, repositories**



Thiers et al. 2019, Fig 1

The Extended Specimen: What's needed?

Molecular Data

MSB:Mamm:92435
Napaeozapus insignis



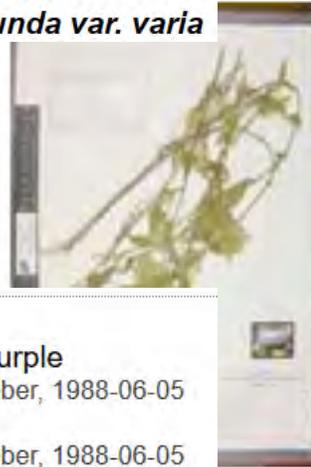
Identifiers

GenBank: [KF440700](#)

- Tissues digitized and data publicly available
- Tissue derivatives linked to specimen data

Phenotypic/Trait Data

UTEP:Herb:44724
Hypoestes floribunda var. *varia*



Attributes

colors: Flowers purple
Joseph Zvonko Weber, 1988-06-05
height: 1 m
Joseph Zvonko Weber, 1988-06-05

- Collected and digitized
- Standardization
- Linked to specimen data

Ecological Data

DMNS:Mamm:11189 **DMNS:Para:46**
Tamias umbrinus montanus *Nematoda*

Relationships

(host of) [DMNS:Para:46](#)
(host of) [DMNS:Para:47](#)

Relationships

(collected with) [DMNS:Para:47](#)
(parasite of) [DMNS:Mamm:11189](#)

MVZ:Bird:155273
Epidonax occidentalis occidentalis



[download MP3](#)
audio (audio/mpeg3)

- Collect biotic associates and their data and link to the specimen
- Standardization
- Link habitat images, video, audio recordings, and other media to physical specimen data

Arctos and the Extended Specimen: Digitized Tissues, Source for Molecular Analysis



MVZ:Bird:188003

Elaenia frantzii ultima Mountain Elaenia

Chiapas, Mexico, 2013-08-23

| Part Name | Condition | Disposition | Qty | InContainer | PLPath | Loan | Event | Remarks |
|---------------------|-----------------------------|---------------|-----|----------------------------------|--|------|-----------|------------------------|
| skin, study | missing feathers on abdomen | in collection | 1 | | | | pickEvent | |
| tissue (RNAlater) | unchecked | in collection | 1 | [MVZ219710] ZRH 814 (cryovial) | [] Museum of Vertebrate Zoology (institution)←[VLSB 1143] VLSB 1143 (room)←[FRZ 2] LN2 Freezer 2 (freezer)←[MVZ4075] Frz2-C-15 (freezer rack)←[MVZ3015] Frz2-C-15-6 (freezer rack position)←[MVZ5749] MVZ5749 (freezer box)←[] 4 (position)←[MVZ219710] ZRH 814 (cryovial) | | pickEvent | Eye, brain, gonad. |
| tissue (ethanol) | unchecked | in collection | 1 | [MVZ219713] ZRH 814 (cryovial) | [] Museum of Vertebrate Zoology (institution)←[VLSB 1143] VLSB 1143 (room)←[FRZ 2] LN2 Freezer 2 (freezer)←[MVZ4075] Frz2-C-15 (freezer rack)←[MVZ3015] Frz2-C-15-6 (freezer rack position)←[MVZ5749] MVZ5749 (freezer box)←[] 1 (position)←[MVZ219713] ZRH 814 (cryovial) | | pickEvent | Muscle. |
| tissue (RNAlater) | unchecked | in collection | 1 | [MVZ219711] ZRH 814 (cryovial) | [] Museum of Vertebrate Zoology (institution)←[VLSB 1143] VLSB 1143 (room)←[FRZ 2] LN2 Freezer 2 (freezer)←[MVZ4075] Frz2-C-15 (freezer rack)←[MVZ3015] Frz2-C-15-6 (freezer rack position)←[MVZ5749] MVZ5749 (freezer box)←[] 3 (position)←[MVZ219711] ZRH 814 (cryovial) | | pickEvent | Liver. |
| tissue (RNAlater) | unchecked | in collection | 1 | [MVZ219712] ZRH 814 (cryovial) | [] Museum of Vertebrate Zoology (institution)←[VLSB 1143] VLSB 1143 (room)←[FRZ 2] LN2 Freezer 2 (freezer)←[MVZ4075] Frz2-C-15 (freezer rack)←[MVZ3015] Frz2-C-15-6 (freezer rack position)←[MVZ5749] MVZ5749 (freezer box)←[] 2 (position)←[MVZ219712] ZRH 814 (cryovial) | | pickEvent | Intestine, lung. |
| tissue (RNAlater) | unchecked | in collection | 1 | [MVZ219709] ZRH 814 (cryovial) | [] Museum of Vertebrate Zoology (institution)←[VLSB 1143] VLSB 1143 (room)←[FRZ 2] LN2 Freezer 2 (freezer)←[MVZ4075] Frz2-C-15 (freezer rack)←[MVZ3015] Frz2-C-15-6 (freezer rack position)←[MVZ5749] MVZ5749 (freezer box)←[] 5 (position)←[MVZ219709] ZRH 814 (cryovial) | | pickEvent | Muscle, heart, kidney. |
| blood (RNAlater) | unchecked | in collection | 1 | [MVZ219708] ZRH 814 (cryovial) | [] Museum of Vertebrate Zoology (institution)←[VLSB 1143] VLSB 1143 (room)←[FRZ 2] LN2 Freezer 2 (freezer)←[MVZ4075] Frz2-C-15 (freezer rack)←[MVZ3015] Frz2-C-15-6 (freezer rack position)←[MVZ5749] MVZ5749 (freezer box)←[] 6 (position)←[MVZ219708] ZRH 814 (cryovial) | | pickEvent | |
| blood (slide smear) | unchecked | in collection | 1 | | | | pickEvent | |

Arctos and the Extended Specimen: Links to Derivative Molecular Data



MVZ:Bird:188003
collector number: 814
Elaenia frantzii ultima

6.2 km W (by road) from center of Tapalapa
on road to Coapilla, Municipio Tapalapa
North America, Mexico, Chiapas
23 Aug 2013 (2013-08-23)

Parts:

tissue (ethanol); tissue (RNAlater); blood (RNAlater); tissue (RNAlater); tissue (RNAlater); skin, study; tissue (RNAlater); blood (slide smear)

Comment or report
bad data [0][0]

[MVZ Bird Collection](#)

[<< Return to results](#)
[get a DOI](#)

[Request Cache Refresh](#)

[Identification](#) [Accn](#) [Locality](#) [Agents](#) [Parts](#) [Part Locn.](#) [Attributes](#) [Other IDs](#) [Media](#) [Encumbrances](#)

[expand all] [collapse all]

Identifications [Edit](#)

Elaenia frantzii ultima

Animalia, Chordata, Aves, Passeriformes, Tyrannidae, Elaeniinae, Elaenia, Elaenia frantzii, Elaenia frantzii ultima

Identified by [Zachary R. Hanna](#) on 2013-11-07

Nature of ID: molecular

Remarks: Species identified by molecular data, subspecies is based on geographic distribution. New species record for Mexico.; Former nature_of_id: molecular data.

Citations

voucher of *Elaenia frantzii ultima* , page 8 in [Hanna et al. 2016](#)
[DOI:10.7717/peerj.1598](#)

Collector(s) [Edit](#)

collector

[Zachary R. Hanna](#)

Identifiers [Edit](#)

GenBank: [KU312259](#)

UNAM: Universidad Nacional Autonoma de Mexico: not recorded
collector number: 814

Links

[GBIF Occurrence](#)

[iDigBio Occurrence](#)

Arctos and the Extended Specimen: Links to Derivative Molecular Data

NCBI Resources How To Sign in to NCBI

Nucleotide Nucleotide Search Advanced Help

GenBank Send to: Change region shown Customize view

Elaenia frantzii isolate ZRH814 NADH dehydrogenase subunit 2 (ND2) gene, complete cds; mitochondrial

GenBank: KU312259.1
[FASTA](#) [Graphics](#) [PopSet](#)

Go to:

| | | | | | |
|------------|---|---------------------|-------------------------------------|--------|-----------------|
| LOCUS | KU312259 | 1041 bp | DNA | linear | VRT 10-MAR-2016 |
| DEFINITION | Elaenia frantzii isolate ZRH814 NADH dehydrogenase subunit 2 (ND2) gene, complete cds; mitochondrial. | | | | |
| ACCESSION | KU312259 | | | | |
| VERSION | KU312259.1 | | | | |
| KEYWORDS | . | | | | |
| SOURCE | mitochondrion Elaenia frantzii | | | | |
| ORGANISM | Elaenia frantzii Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Archelosauria; Archosauria; Dinosauria; Saurischia; Theropoda; Coelurosauria; Aves; Neognathae; Passeriformes; Tyrannidae; Elaenia. | | | | |
| REFERENCE | 1 (bases 1 to 1041) | | | | |
| AUTHORS | Hanna,Z.R., Ortiz-Ramirez,M.F., Rios-Munoz,C.A., Cayetano-Rosas,H., Bowie,R.C. and Navarro-Siguenza,A.G. | | | | |
| TITLE | Phylogenetic and morphologic evidence confirm the presence of a new montane cloud forest a | | | | |
| | FEATURES | Location/Qualifiers | | | |
| | Mountain Elaenia (Elaer | source | 1..1041 | | |
| | Tyrannidae) | | /organism="Elaenia frantzii" | | |
| | | | /organelle="mitochondrion" | | |
| | | | /mol_type="genomic DNA" | | |
| | | | /isolate="ZRH814" | | |
| | | | /specimen_voucher="MVZ:Bird:188003" | | |
| | | | /db_xref="taxon:502636" | | |
| JOURNAL | PeerJ 4, E1598 (2016) | | | | |
| PUBMED | 26855860 | | | | |
| REMARK | Publication Status: Onl | | | | |
| REFERENCE | 2 (bases 1 to 1041) | | | | |

Analyze this sequence
Run BLAST
Pick Primers
Highlight Sequence Features
Find in this Sequence

Related information
Protein
PubMed
Taxonomy
BioCollections
Full text in PMC
PopSet

LinkOut to external resources
MVZ:Bird:188003 [Arctos Specimen Database]

Arctos and the Extended Specimen: Standardized phenotypic and trait data

Access to 3,591,352 records

Search Clear Form Use Last Values See results as: s

Type: any Require Tissues?

Identifiers

Collection: Select options

Catalog Number:

Any Identifier:

Identification and Taxonomy

Any taxon, ID, common name:

Locality

Any Geographic Element:

Date/Collector

Help Agent Role Define

Specimen Record

Part Name:

[pick an attribute]

Add attribute for more search options. Empty values are ignored.

- abundance
- age
- age class
- air temperature
- archaeological feature
- axillary girth
- bill depth
- bill length
- bill width
- body condition
- body temperature
- body width
- breadth
- brood parasite present
- brood patch
- bursa
- bursa length
- bursa width
- calcar length
- [pick an attribute]

| AGE_CLASS | Collection | |
|------------|------------|--|
| 1st instar | Ento | The developmental stage of an arthropod between hatching and first molt. |
| 2nd instar | Ento | The developmental stage of an arthropod between first and second molt. |
| 3rd instar | Ento | The developmental stage of an arthropod between second and third molt. |
| 4th instar | Ento | The de |
| 5th instar | Ento | The de |

Access to 3,591,357 records

Search Clear Form Use Last Values See results as: Specimen Records

Type: any Require Tissues?

Identifiers

Collection: Select options

Catalog Number:

Any Identifier:

Identification and Taxonomy

Any taxon, ID, common name:

Locality

Any Geographic Element:

Date/Collector

Help Agent Role Define

Specimen Record

Part Name:

age class 2nd instar

Add attribute for more search options. Click the label after selecting an attribute type for more information. Empty values are ignored.

Found 13 specimens. About

Tools: Map, Customize, or Download

HTML vers

Specimen Results

| <input type="checkbox"/> | GUID | Identified As | country | state/province | specific locality | verbatim date |
|--------------------------|-----------------------------|---------------------|---------------|----------------|---|---------------|
| <input type="checkbox"/> | KNWR:Ento:10279 referral | Cixius meridionalis | United States | Alaska | Soldotna, Headquarters Lake wetland | 15.July.2013 |
| <input type="checkbox"/> | KNWR:Ento:8883 referral | Cixius meridionalis | United States | Alaska | Soldotna, Headquarters Lake. Wetland on SW shore of lake. | 7.June.2013 |
| <input type="checkbox"/> | KNWR:Ento:8914 referral | Cixius meridionalis | United States | Alaska | Soldotna. Pond near Headquarters Lake. | 26.June.2013 |

Arctos and the Extended Specimen: Links to Field Notes and Preparation Catalogs

Arctos Collaborative Collection Management Solution

Search Enter Data Manage Data Manage Arctos Reports/Services Portals My Stuff About/Help

Robert L. Rausch Necropsy Ledger
Search document by Description
Description; prefix/suffix with % for substring search document

Page Previous 625 (2 TAGS) Next of 4481

[Media Details] [edit media] [download master]

description: 11441
created by agent: Robert L. Rausch
derived from media: 10426225
shows cataloged_item: MSB:Host:1024
shows cataloged_item: MSB:Para:3581

| No. | Host | Sex | Date | Locality | Weight | Cestode | Trematode | Nematode | Remarks |
|-------|-----------|-----|-------------|--------------|--------|---------|-----------------------------------|------------|----------|
| 11441 | PTARMIGAN | ♂ | Oct 1 | MT. FAIRPLAY | | | BRACHYLAEHUS | | |
| 11442 | WOLF | ♂ | 23 OCT 1951 | ANAK. PASS | ADULT | TAENIA | Skull labelled May 26 June 26 '52 | TOXASCARIS | HOOKWORM |
| 11443 | WOLF | ♀ | - | ANAK PASS | ADULT | TAENIA | | TOXASCARIS | |
| 11444 | WOLF | ♂ | 28 OCT 1951 | TOLUYAK | ADULT | TAENIA | Skull labelled May 26 '52 | TOXASCARIS | |
| 11445 | WOLF | ♀ | 3 DEC | ANAK. | ADULT | TAENIA | | | |

Media tags link to cataloged items

Media links to cataloged items

Arctos and the Extended Specimen: Links to Field Notes and Preparation Catalogs

 Collaborative Collection Management Solution

Search Portals My Stuff About/Help

MSB:Host:1024 **Tulugak Lake, Anaktuvuk Pass** observation

Canis lupus North America, United States, Alaska, Chandler Lake Quad
Oct 28 1951

[Comment or report bad data \[0\]\[0\]](#)
[MSB Hosts \(of parasites\)](#)

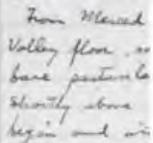
first prevnext last
Record 17 of 51

[expand all] [collapse all]

Identifications

Canis lupus
Animalia; Chordata; Mammalia; Carnivora; Canidae; Canis lupus Linnaeus, 1758
Bheriya, Bighana, Common Wolf, Farkas, Grey Wolf, Hunt, Kurt, Lobo, Lobo comum, Lobo comùn, Lobo gris, Loup, Loup gris, Loup vulgaire, Lup, Lupo, Lupo comune, Lupu; Nekra; Susi; Timber Wolf; Ujku, Ulv; Varg; Vilkas; Vik; Vik dravý; Vuk;
Identified by Robert L. Rausch on 1951-10-28
Nature of ID: legacy
Remarks: verbatim ID = Wolf

Tagged in Media



Collector(s)
Robert L. Rausch

Identifiers
collector number: 11444

Relationships [collapse]

(host of) [MSB:Para:3581](#)
family@2019-04-25: Taeniidae
identification@2019-04-25: Taenia
locality@2019-04-25: North America, United States, Alaska, Chandler Lake Quad: Tulugak Lake, Anaktuvuk Pass

(host of) [MSB:Para:3582](#)
family@2019-04-25: Ascarididae
identification@2019-04-25: Toxascaris
locality@2019-04-25: North America, United States, Alaska, Chandler Lake Quad: Tulugak Lake, Anaktuvuk Pass

(same individual as) [MCZ:Mamm:46546](#)

Links
[GBIF Occurrence](#)
[iDigBio Occurrence](#)

Media thumbnails included on specimen page – click to view

Arctos and the Extended Specimen: Links to Field Notes and Preparation Catalogs



MCZBASE: The Database of the Zoological Collections
Museum of Comparative Zoology - Harvard University

Search

Help



text (text/html)

License: MCZ Permissions & Copyright 

- MCZ Mammalogy Mammals 045831-052330, pg.29
- made date: 2010-12-01
- credit: Museum of Comparative Zoology, Harvard University
- ledger entry for cataloged_item [Mammalogy 46531 \(Ursus maritimus\)](#)
- ledger entry for cataloged_item [Mammalogy 46532 \(Ursus maritimus\)](#)
- ledger entry for cataloged_item [Mammalogy 46533 \(Ursus maritimus\)](#)
- ledger entry for cataloged_item [Mammalogy 46538 \(Mustela frenata noveboracensis\)](#)
- ledger entry for cataloged_item [Mammalogy 46539 \(Ursus arctos stikeenensis\)](#)
- ledger entry for cataloged_item [Mammalogy 46541 \(Alces alces americana\)](#)
- ledger entry for cataloged_item [Mammalogy 46542 \(Myotis keenii septentrionalis\)](#)
- ledger entry for cataloged_item [Mammalogy 46543 \(Myotis keenii septentrionalis\)](#)
- ledger entry for cataloged_item [Mammalogy 46544 \(Lynx rufus pallescens\)](#)
- ledger entry for cataloged_item [Mammalogy 46545 \(Canis lupus tundrarum\)](#)
- ledger entry for cataloged_item [Mammalogy 46546 \(Canis lupus tundrarum\)](#)
- ledger entry for cataloged_item [Mammalogy 46547 \(Canis lupus tundrarum\)](#)
- ledger entry for cataloged_item [Mammalogy 46548 \(Canis lupus tundrarum\)](#)
- ledger entry for cataloged_item [Mammalogy 46549 \(Canis lupus pambasileus\)](#)
- ledger entry for cataloged_item [Mammalogy 46550 \(Canis lupus tundrarum\)](#)
- ledger entry for cataloged_item [Mammalogy 46551 \(Canis lupus tundrarum\)](#)
- ledger entry for cataloged_item [Mammalogy 46552 \(Canis lupus tundrarum\)](#)
- ledger entry for cataloged_item [Mammalogy 46553 \(Canis lupus tundrarum\)](#)
- ledger entry for cataloged_item [Mammalogy 46554 \(Canis lupus tundrarum\)](#)
- ledger entry for cataloged_item [Mammalogy 46555 \(Gulo luscus luscus\)](#)

Direct links to all records in ledger

Arctos and the Extended Specimen: Links between Related Specimens

Host/Parasite

CHAS:Bird:2018.1.3
Zonotrichia albicollis

Relationships

(*host of*) [CHAS:Ento:2018.1.3](#)
identification@2019-05-13: Acari

CHAS:Ento:2018.1.3
Acari

Relationships

(*parasite of*) [CHAS:Bird:2018.1.3](#)
family@2019-05-13: Passerellidae
identification@2019-05-13: Zonotrichia albicollis

Same Individual/Different Collection

MSB:Mamm:210449
Ctenomys opimus

Relationships

(*same individual as*)

[AMNH: American Museum of Natural History:M-260839](#)

Parent/Offspring

UAM:Mamm:92345
Microtus oeconomus

Relationships

(*parent of*) [UAM:Mamm:92475](#)
family@2019-04-25: Cricetidae
identification@2019-04-25: Microtus oeconomus

UAM:Mamm:92475
Microtus oeconomus

Relationships

(*offspring of*) [UAM:Mamm:92345](#)
family@2019-04-22: Cricetidae
identification@2019-04-22: Microtus oeconomus



OCCURRENCE | 4 AUGUST 1984

Ctenomys opimus Wagner, 1848

Highland Tuco-tuco In English Collected in Bolivia, Plurinational State of
Animalia > Chordata > Mammalia > Rodentia > Ctenomyidae > Ctenomys

Species: *Ctenomys opimus* Wagner, 1848

Location: South America > Bolivia, Plurinational State of

Elevation: 3720m

Basis of record: Preserved specimen

Dataset: AMNH Mammal Collections

Publisher: American Museum of Natural History

Biotic relationships are shared with Global Biotic Interactions (GloBI)

Arctos and the Extended Specimen: Repeated Sampling for an Individual



Same Individual/
Repeated Sampling

MSB:Mamm
231715
Canis lupus baileyi

| Part Name | Condition | Disposition | Qty | Remarks |
|--------------------------------------|-----------|-----------------|-----|---|
| blood (EDTA) | Good | in collection | 1 | Frozen; Accession unknown, NK 108020, Coll: 2 Sept 2002 |
| blood (EDTA) | Good | in collection | 1 | Frozen; Accession unknown, NK 108020, Coll: 2 Sept 2002 |
| blood (EDTA) | Good | on loan | 1 | Frozen; Accession unknown, NK 108020, Coll: 2 Sept 2002 |
| blood (EDTA) | Good | in collection | 1 | Blood sampling |
| blood (EDTA) | Good | in collection | 1 | Frozen; Accession unknown, NK 108020, Coll: 2 Sept 2002 |
| blood (EDTA) | Good | in collection | 1 | Frozen; Accession unknown, NK 108020, Coll: 2 Sept 2002 |
| blood (EDTA) | Good | in collection | 1 | Frozen; Accession unknown, NK 108020, Coll: 2 Sept 2002 |
| blood serum (frozen) | Good | in collection | 1 | Accession unknown, NK 108020, Coll: 2 Sept 2002 |
| blood (EDTA) | very good | in collection | 1 | Accession 2011.004.Mamm, NK 108349, 20 June 2011 |
| blood (EDTA) | excellent | in collection | 1 | Accession 2011.061.Mamm, NK 108383, Coll: 16 Sept 2011 |
| blood serum (frozen) | excellent | in collection | 1 | Accession 2011.061.Mamm, NK 108383, Coll: 16 Sept 2011 |
| blood (EDTA) | good | in collection | 1 | Accession 2011.061.Mamm, NK 108383, Coll: 16 Sept 2011; is not recorded on NK sheet (Kaylen M. Jones) |
| blood (EDTA) | very good | in collection | 1 | Accession 2011.076.Mamm, NK 108388, Coll: 16 Sept 2011 |
| blood (EDTA) | excellent | in collection | 1 | Frozen; Accession 2013.083.Mamm, NK 226678, Coll: 22 Oct 2013 |
| blood (EDTA) | excellent | in collection | 1 | Frozen; Accession 2013.083.Mamm, NK 226678, Coll: 22 Oct 2013 |
| blood (EDTA) | excellent | in collection | 1 | Frozen; Accession 2013.083.Mamm, NK 226678, Coll: 22 Oct 2013 |
| blood (EDTA) | excellent | in collection | 1 | Frozen; Accession 2013.083.Mamm, NK 226678, Coll: 22 Oct 2013 |
| blood (EDTA) | excellent | in collection | 1 | Frozen; Accession 2013.083.Mamm, NK 226678, Coll: 22 Oct 2013 |
| blood (EDTA) | excellent | in collection | 1 | Frozen; Accession 2013.083.Mamm, NK 226678, Coll: 22 Oct 2013 |
| blood serum (frozen) | excellent | in collection | 1 | Accession 2013.083.Mamm, NK 226678, Coll: 22 Oct 2013 |
| blood serum (frozen) | excellent | in collection | 1 | Accession 2013.083.Mamm, NK 226678, Coll: 22 Oct 2013 |
| blood serum (frozen) | excellent | in collection | 1 | Accession 2013.083.Mamm, NK 226678, Coll: 22 Oct 2013 |
| blood serum (frozen) | excellent | in collection | 1 | Accession 2013.083.Mamm, NK 226678, Coll: 22 Oct 2013 |
| blood serum (frozen) | excellent | in collection | 1 | Accession 2013.083.Mamm, NK 226678, Coll: 22 Oct 2013 |
| blood serum (frozen) | excellent | in collection | 1 | Accession 2013.083.Mamm, NK 226678, Coll: 22 Oct 2013 |
| blood serum (frozen) | excellent | in collection | 1 | Accession 2013.083.Mamm, NK 226678, Coll: 22 Oct 2013 |
| skin, flat | unchecked | being processed | 1 | Face Mask; Accession 2014.017.Mamm, NK 267767, Prep: 3 April 2015 |
| blood (EDTA) | excellent | in collection | 1 | Frozen; Accession 2013.087.Mamm, NK 226685, Coll: 16 Dec 2013 |
| blood (EDTA) | excellent | in collection | 1 | Frozen; Accession 2013.087.Mamm, NK 226685, Coll: 16 Dec 2013 |
| blood (EDTA) | excellent | in collection | 1 | Frozen; Accession 2013.087.Mamm, NK 226685, Coll: 16 Dec 2013 |
| blood serum (frozen) | excellent | in collection | 1 | Accession 2013.087.Mamm, NK 226685, Coll: 16 Dec 2013 |
| blood serum (frozen) | excellent | in collection | 1 | Accession 2014.001.Mamm, NK 226690, Coll: 20 Dec 2013 |
| muscle (frozen) | unchecked | being processed | 1 | Accession 2014.017.Mamm, NK 267767, Prep: 3 April 2015 |
| heart, kidney, lung, spleen (frozen) | unchecked | being processed | 1 | Accession 2014.017.Mamm, NK 267767, Prep: 3 April 2015 |
| | | | | Specimen prep |

Blue Range
Wolf Reintro.
Area
2 Sep 2002

Blue Range
Wolf Reintro.
Area
20 June 2011

Blue Range
Wolf Reintro.
Area
22 Oct 2013

Wolf Haven Int.,
WA
16 Dec 2013

Wolf Conservation
Center, NY
15 Feb 2014

Arctos and the Extended Specimen: Repeated Sampling for an Individual

Same Individual/
Repeated Sampling

Mammal Collection
Museum of Southwestern Biology

Search Portals My Stuff Join Arctos About/Help

MSB:Mamm:231715 **Wolf Conservation Center, South Salem**
Canis lupus baileyi

North America, United States, New York, Westchester County
15 Feb 2014 (2014-02-15)

Parts:
skull; blood (EDTA); blood (EDTA); blood (EDTA); blood (EDTA); blood serum (frozen); blood (EDTA); blood (EDTA); blood (EDTA); blood (EDTA); blood (EDTA); blood (EDTA); blood serum (frozen); blood serum (frozen); blood serum (frozen); blood (EDTA); blood (EDTA); blood serum (frozen); muscle (frozen); heart, kidney, lung, spleen (frozen); blood (EDTA); blood serum (frozen); blood (EDTA); blood (EDTA); blood serum (frozen); skin, flat; blood serum (frozen); liver (frozen); tongue (frozen); skeleton, postcranial; blood serum (frozen); blood (EDTA); blood (EDTA); blood (EDTA) sample

Comment or report bad data [0][0]

[MSB Mammals](#)

expand all | collapse all

Identifications [expand]
Canis lupus baileyi

Animalia, Chordata, Mammalia, Carnivora, Caniformia, Canidae, Canis, Canis lupus, Canis lupus baileyi
Lobo Mexicano; Mexican wolf
Identified by [U. S. Fish and Wildlife Service Mexican Wolf Recovery Program](#) on 2005-03-10
Nature of ID: features
Confidence: high
Remarks: Former nature_of_id: expert.

Collector(s)
collector
[U. S. Fish and Wildlife Service Mexican Wolf Recovery Program](#)
[Wolf Haven International](#)

preparator
[Cheryl A. Parmenter](#)
[MSB Division of Mammals Staff \(2015\)](#)

Identifiers [expand]
Mexican wolf studbook number: 795
NK: 108020
NK: 108388
NK: 108383
NK: 226685
NK: 226690
NK: 108349
NK: 226678

Media
Media linked to this Cataloged Item.
Showing results 1 - 4 of 4 [Media Gallery](#)

text (application/pdf) Media Details NK 108001-108050

text (application/pdf) Media Details NK 226651-226700

text (application/pdf) Media Details NK 108376-108400

text (application/pdf) Media Details NK 108326-108350

Links

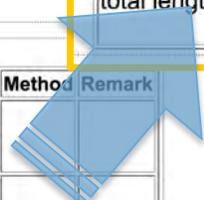
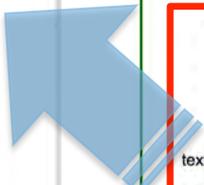
[GBIF Occurrence](#)

Attributes [collapse]

| Attribute | Value | Determiner | Date | Method | Remark |
|--------------------------|---------|---|------------|--------|--------|
| ear from notch | 112 mm | MSB Division of Mammals Staff (2015) | 2015-04-03 | | |
| ectoparasite examination | no | MSB Division of Mammals Staff (2015) | 2015-04-03 | | |
| endoparasite examination | no | MSB Division of Mammals Staff (2015) | 2015-04-03 | | |
| hind foot with claw | 232 mm | MSB Division of Mammals Staff (2015) | 2015-04-03 | | |
| sex | male | U. S. Fish and Wildlife Service Mexican Wolf Recovery Program | 2005-03-10 | | |
| tail length | 400 mm | MSB Division of Mammals Staff (2015) | 2015-04-03 | | |
| total length | 1595 mm | MSB Division of Mammals Staff (2015) | 2015-04-03 | | |

Attributes [collapse]

| Attribute | Value | Determiner | Date | Method | Remark |
|--------------------------|--------|--|------------|--------|--------|
| ear from notch | 112 mm | MSB Division of Mammals Staff (2015) | 2015-04-03 | | |
| ectoparasite examination | no | MSB Division of Mammals Staff (2015) | 2015-04-03 | | |



Location (8 Events) [expand]

MSB Museum of Southwestern Biology Biological Materials Database University of New Mexico

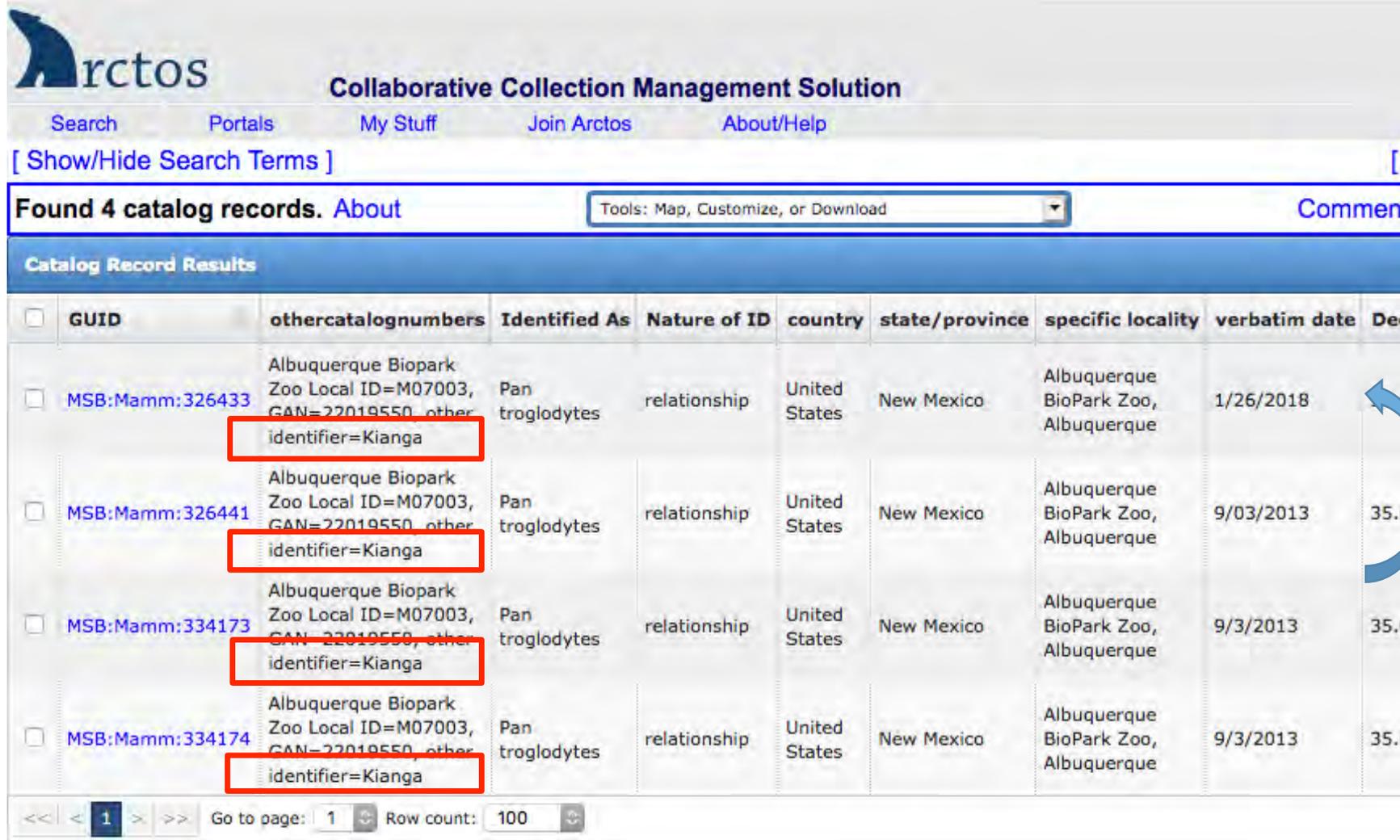
Collector: *U.S. Fish and Wildlife Service Mexican Wolf Recovery Program*
Preparator: *Cheryl A. Parmenter*
Species: *Canis lupus baileyi*
Country/State: *USA/NE* County:
District (e.g. state, NHP Park):
Specific locality:
Latitude: Longitude: Authority:
Date of death/collector: *15 Feb 2014* preparation:
Nature of voucher (check one or more): BMT BMU SKMT
 full-preserved whole frozen tissue only other

| Preserved tissue | Radio | gms | Preserved tissue | Radio | gms |
|------------------|-------|-----|------------------|-------|-----|
| H, L, S, St | | | blood | | |
| liver | | | spleen | | |
| heart | | | pancreas | | |
| kidney | | | prostate | | |
| lung | | | ovaries | | |
| spine | | | testes | | |
| stomach | | | other | | |
| heart, lobes | | | other | | |

Condition of tissues (check one) (type): 2 3 4 (quantity)
Relationship: *SK*
Repro condition:
Measurements (check one) (type): N Endoparasites Present? Y N
Examined for Ectoparasites? Y N Ectoparasites Present? Y N
Remarks:
Signed: *CP 10/25/14* Accepted: *CH 10/25/14*

Arctos and the Extended Specimen: Repeated Sampling for an Individual

Same Individual/
Repeated Sampling



Arctos Collaborative Collection Management Solution

Search Portals My Stuff Join Arctos About/Help

[Show/Hide Search Terms]

Found 4 catalog records. About Tools: Map, Customize, or Download

Catalog Record Results

| <input type="checkbox"/> | GUID | othercatalognumbers | Identified As | Nature of ID | country | state/province | specific locality | verbatim date | De |
|--------------------------|---------------------------------|--|-----------------|--------------|---------------|----------------|--------------------------------------|---------------|------|
| <input type="checkbox"/> | MSB:Mamm:326433 | Albuquerque Biopark Zoo Local ID=M07003, GAN=22019550, other identifier=Kianga | Pan troglodytes | relationship | United States | New Mexico | Albuquerque BioPark Zoo, Albuquerque | 1/26/2018 | |
| <input type="checkbox"/> | MSB:Mamm:326441 | Albuquerque Biopark Zoo Local ID=M07003, GAN=22019550, other identifier=Kianga | Pan troglodytes | relationship | United States | New Mexico | Albuquerque BioPark Zoo, Albuquerque | 9/03/2013 | 35.1 |
| <input type="checkbox"/> | MSB:Mamm:334173 | Albuquerque Biopark Zoo Local ID=M07003, GAN=22019550, other identifier=Kianga | Pan troglodytes | relationship | United States | New Mexico | Albuquerque BioPark Zoo, Albuquerque | 9/3/2013 | 35.1 |
| <input type="checkbox"/> | MSB:Mamm:334174 | Albuquerque Biopark Zoo Local ID=M07003, GAN=22019550, other identifier=Kianga | Pan troglodytes | relationship | United States | New Mexico | Albuquerque BioPark Zoo, Albuquerque | 9/3/2013 | 35.1 |

<< 1 >> Go to page: 1 Row count: 100

Arctos and the Extended Specimen: Repeated Sampling for an Individual

Same Individual/
Repeated Sampling

Search Portals My Stuff Join Arctos About/Help

MSB:Mamm:326433 Albuquerque BioPark Zoo, Albuquerque
 North America, United States, New Mexico, Bernalillo County
 1/26/2018 (2018-01-26)

Parts: blood serum (frozen); blood serum (frozen) sample

Comment or report bad data [0][0]

[MSB Mammals](#)

<< Return to results

[expand all] [collapse all]

Identifications [collapse]
Pan troglodytes
 Animalia, Chordata, Mammalia, Primates, Anthrooidea, Hominidae, Pan, Pan troglodytes
 Chimpancé; Chimpanzee; Chimpanzé; Common chimpanzee; Robust chimpanzee; chimpanzee; schimpans
 Identified by [Albuquerque BioPark](#) on 2016-01-26
 Nature of ID: relationship
 Confidence: high
 Remarks: Former nature_of_id: ID of kin.

Media

Location (1 Events)
 [BerkeleyMapper](#)

highlight linked components

Event Type **encounter**
 assigned by Albuquerque BioPark on 2018-01-26
 Event Date: 2018-01-26
 Verbatim Date: 1/26/2018
 Higher Geography: [North America, United States, New Mexico, Bernalillo County](#) details
 Locality Nickname: RIO GRAND
 Specific Locality: Albuquerque BioPark Zoo, Albuquerque details
 Verbatim Locality: Albuquerque Biopark details
 Standardized Place Name: United States, New Mexico, Bernalillo County
 Locality Remarks: RIO GRAND
 Coordinates: 35.078382 / -106.663485
 As Entered: 

Collector(s)
 collector
[Albuquerque BioPark](#)

Identifiers
 Albuquerque Biopark Zoo Local ID: M07003
 GAN: 22019550
 other identifier: Kianga

Relationships [collapse] [Find All] [Find offspring of] [Find same individual as]
 (offspring of) GAN:20700631
 (offspring of) GAN:20700630
 (same individual as) [MSB:Mamm:326441](#)
 :family@2020-04-28: Hominidae
 :identification@2020-04-28: Pan troglodytes
 :locality@2020-04-28: North America, United States, New Mexico, Bernalillo County: ABQ BioPark Zoo, Albuquerque

Links
[GBIF Occurrence](#)
[iDigBio Occurrence](#)

Attributes

| Attribute | Value | Determiner | Date | Method | Remark |
|-------------|----------|-------------------------------------|------------|--------|-------------------------|
| age class | juvenile | Albuquerque BioPark | 2019-03-16 | | |
| numeric age | 9 years | Albuquerque BioPark | 2016-01-26 | | birth date Feb 04, 2007 |
| sex | female | Albuquerque BioPark | 2016-01-26 | | |

Opportunity to connect!

Arctos Projects:

Shareable, data-driven web pages to contextualize records



Shareable,
persistent URL

Project Title with
linked people and
organizations

HTML-enabled
text to describe
project, study or
add customized
links

Data-driven links
enabled by
accession or loan
activities

The screenshot shows the Arctos web interface. At the top, there is a navigation bar with the Arctos logo, the text 'Collaborative Collection Management Solution', and links for Search, Portals, My Stuff, Join Arctos, and About/Help. A search box with the text 'mkoo' and a password field with asterisks are visible, along with 'Log In' and 'Create Account' buttons. Below the navigation bar, the main heading is 'U.S. Fish & Wildlife Service Mexican Wolf Recovery Program'. Underneath, it lists 'United States Fish and Wildlife Service: Project Coordinator', 'U. S. Fish and Wildlife Service Mexican Wolf Recovery Program: Project Coordinator', and 'Maggie Dwire: Co-PI (Assistant Coordinator for Mexican Wolf Recovery Program)' with the date '2000-01-01 -'. A 'Description' section follows, featuring a photo of a Mexican wolf and text explaining that the Museum of Southwestern Biology is a designated repository for the USFWS Mexican Wolf (*Canis lupus baileyi*) Recovery Program. Below the photo is a caption: 'Photo of MSB:Mamm:259087, Mexican wolf studbook number: 190'. The 'Catalog Records Used' section lists three items: '3 DGR:Mamm catalog records [BerkeleyMapper]', '179 MSB:Mamm catalog records [BerkeleyMapper]', and '182 total catalog records [BerkeleyMapper]'. The 'Catalog Records Contributed' section lists four items: '1137 MSB:Mamm Catalog Records [BerkeleyMapper]', '3 MSBObs:Mamm Catalog Records [BerkeleyMapper]', '7 DGR:Mamm Catalog Records [BerkeleyMapper]', and '1147 total catalog records [BerkeleyMapper]'. A 'Login or Create Account' link is also present in the top right corner.

Data-driven links
can also include
media (images,
video, etc) and
other projects

Arctos Projects:

Shareable, data-driven web pages to contextualize records



Zoo and Museum partners!

The screenshot shows the Arctos website interface. At the top, there is a navigation bar with the Arctos logo, the text "Collaborative Collection Management Solution", and a search bar. Below the navigation bar, the main heading reads "Albuquerque Biopark Zoo / Museum of Southwestern Biology Specimen Repository Agreement". Underneath, a list of project coordinators is provided: Gwen A. Dragoo, Christopher C. Witt, Joseph A. Cook, Mariel L. Campbell, and Jonathan L. Dunnum. The date "2018-07-19" is also visible. The "Description" section explains the repository agreement between the Museum of Southwestern Biology, University of New Mexico, and the Rio Grande Zoo. The "Catalog Records Contributed" section lists "1093 MSB:Mamm Catalog Records [BerkeleyMapper]". The "Projects using contributed catalog records" section lists four projects, each with a title and the note "This project produced no publications." A blue arrow points from the "Catalog Records Contributed" section to the "Projects using contributed catalog records" section.

Arctos Collaborative Collection Management Solution

Search Portals My Stuff Join Arctos About/Help

mkoo *****
Log In or Create Account

Log In or Create Account

Albuquerque Biopark Zoo / Museum of Southwestern Biology Specimen Repository Agreement

Gwen A. Dragoo: Project Coordinator
Christopher C. Witt: Project Coordinator
Joseph A. Cook: Project Coordinator
Mariel L. Campbell: Project Coordinator
Jonathan L. Dunnum: Project Coordinator
2018-07-19 -

Description

Repository agreement between the Museum of Southwestern Biology, University of New Mexico, and the Rio Grande Zoo of the Albuquerque Biopark, for the transfer of carcasses and specimen samples and associated data to the MSB archive. Data on zoo specimens is harvested with permission from the Species 360 Zoological Information Management ZIMS (<https://zims.species360.org>) database.

Catalog Records Contributed

- 1093 MSB:Mamm Catalog Records [BerkeleyMapper]

Projects using contributed catalog records

4 Projects used catalog records contributed by this project. Those projects produced 0 publications which include 0 citations.

- Assessing Long-Term Stress in Great Apes: Allostatic Load in Chimpanzees (*Pan troglodytes*) and Bonobos (*Pan paniscus*)
This project produced no publications.
- Elephant endotheliotropic herpesvirus (EEHV) infections in juvenile elephants.
This project produced no publications.
- Range-Wide Genomic Assessment of Snow Leopards (*Panthera uncia* syn *Uncia uncia*)
This project produced no publications.
- Systemic Vitamin A levels in Snow Leopards in Association with Eyelid Coloboma
This project produced no publications.

Impact! Linked projects and pubs using records generated from this project

Extended Specimens and Individual Attribution:

Agents standardize people and link to sources within and outside of Arctos

Agent Relationships:

- spouse of [Hilda W. Grinnell](#)
- employee of [Museum of Vertebrate Zoology, University of California, Berkeley](#)
- grandparent of [June R. Grinnell](#)
- [Willard F. Grinnell](#) is child of
- [Hilda W. Grinnell](#) is spouse of
- [Richard A. Grinnell](#) is child of
- [Stuart W. Grinnell](#) is child of
- [Molly Grinnell](#) is child of
- [June R. Grinnell](#) is grandchild of

Joseph Grinnell (person)

Agent Names:

- Grinnell J. (aka)
- Joseph (first name)
- Grinnell (last name)
- J. Grinnell (aka)
- Grinnell, Joseph (aka)
- Joseph Grinnell (preferred)

Address:

*Supports ORCID  WIKIDATA 

- url: <https://lccn.loc.gov/n83064222>
- url: https://en.wikipedia.org/wiki/Joseph_Grinnell
- Wikidata: <https://www.wikidata.org/wiki/Q927582>

Collector [done]

| Role | Collection | SpecimenCount | Link |
|-----------|------------|---------------|---------------------------------------|
| (any) | (all) | 19856 | Open Specimen Results |
| collector | (all) | 19856 | Open Specimen Results |
| (any) | CHAS:Bird | 2 | Open Specimen Results |
| collector | CHAS:Bird | 2 | Open Specimen Results |
| (any) | DMNS:Egg | 6 | Open Specimen Results |
| collector | DMNS:Egg | 6 | Open Specimen Results |
| (any) | MVZ:Bird | 13021 | Open Specimen Results |
| collector | MVZ:Bird | 13021 | Open Specimen Results |
| (any) | MVZ:Egg | 484 | Open Specimen Results |
| collector | MVZ:Egg | 484 | Open Specimen Results |

Projects

- [Historic Grinnell Survey: Yosemite Transect](#)
- [Historic Grinnell Survey: Joshua Tree National Park](#)
- [Historic Grinnell Survey: Southern Sierra Nevada Transect](#)
- [Historic Grinnell Survey: Lassen Transect](#)
- [Historic Grinnell Survey: I-80 Corridor](#)

Media:

- 625 created by agent entries.
- 24 shows agent entries.
- [Media from 1525 collected/prepared specimens](#)
- Assigned 0 Media Relationships.
- Assigned 0 Media Labels.



Identification:

- 57 identifications for 57 MVZ:Mamm specimens
- 83 identifications for 83 MVZ:Bird specimens
- 31 identifications for 31 UCM:Mamm specimens
- 1 identifications for 1 UCM:Bird specimens

Transactions

- authorized by for Loan [MVZ:Bird 1917.371.Bird](#)
- authorized by for Loan [MVZ:Bird 1917.400.Bird](#)
- authorized by for Loan [MVZ:Bird 1917.413.Bird](#)
- authorized by for Loan [MVZ:Bird 1917.414.Bird](#)
- authorized by for Accession [MVZ:Bird -99999](#)
- authorized by for Accession [MVZ:Bird -99999](#)

Publications

- [Joseph Grinnell. 1912. A name for the Hawaiian Linnet. Auk 29:24-25.](#)
 - 1 citations
- [Joseph Grinnell. 1931. A new pocket gopher from southeastern California. University of California Publications in Zoology 38\(1\):1-10.](#)
 - 1 citations
- [Joseph Grinnell. 1915. Field Notes: Grinnell J. 1914-15.](#)
 - 0 citations
- [Joseph Grinnell, Frank Stephens, Joseph S. Dixon, Edmund Heller. 1909. Birds and mammals of the 1907 Alexander Expedition to southeastern California. University of California Publications in Zoology 5\(2\):171-264.](#)

Specimen Attribute Determiner:

- 6 attributes for 6 UWYMV:Bird specimens
- 3 attributes for 3 DMNS Egg specimens
- 149 attributes for 31 UCM:Mamm specimens
- 3 attributes for 2 CHAS:Bird specimens

Extended Specimens and Individual Attribution:

Leveraging external tools to document research impacts

Found 52 specimens.

Specimen Results

- GUID
- UAM:Mamm:76302
2 Events
voucher(2)
- UAM:Mamm:67071
2 Events
voucher(3)
- MSB:Mamm:41088
voucher
- MSB:Mamm:41161
voucher(2)

John R. Demboski and Joseph A. Cook. 2001. Phylogeography of the dusky shrew (Soricidae): insight into deep and shallow history in northwestern North America

- Report Problem
- 52 Cited Specimens
- 52 *sensu* Identifications
- <http://dx.doi.org/10.1046/j.1365-294x.2001.01260.x>
 - References Count: 100
 - Referenced By Count: 77
 - CrossRef Data
- Edit
- Manage Citations
- Publication Agents
 - John R. Demboski
 - Joseph A. Cook

Media Details
Demboski_and_Cook_2001...

Pubs referenced (via Crossref)

Pubs citing this Pub (via OpenCitations)

References (from <http://crossref.org>) (via Crossref)

Alexander LF 1996.

Arbogast, B. S. [online]. 1999. Mitochondrial DNA Phylogeography of the New World Flying Squirrels (Glaucomys): Implications for Pleistocene Biogeography. *Journal of Mammalogy* 80:142–155. Oxford University Press (OUP).
<http://dx.doi.org/10.2307/1383215>
[more information]
[view raw data](#)
Arctos Publication

Arbogast, B. S. [online]. 1998. Pleistocene Speciation and the Mitochondrial DNA Clock. *Science* 282:1955a–1955. American Association for the Advancement of Science (AAAS).
<http://dx.doi.org/10.1126/science.282.5396.1955a>
[more information]
[view raw data](#)
Auto-Create

Avise, J. C. [online]. 1992. Molecular Population Structure and the Biogeographic History of a Regional

voucher of *Sorex neomexicanus*, page 1230 in Demboski and Cook 2001
[DOI:10.1046/j.1365-294x.2001.01260.x](https://doi.org/10.1046/j.1365-294x.2001.01260.x)

Wiley Online Library

Phylogeography of the dusky shrew, *Sorex monticolus* (Insectivora, Soricidae): insight into deep and shallow history in northwestern North America

John R. Demboski, Joseph A. Cook

First published: 21 December 2001 | <https://doi.org/10.1046/j.1365-294X.2001.01260.x> | Cited by: 84

Joseph A. Cook (person)

Joseph Cook

ORCID iD

<https://orcid.org/0000-0003-3985-0670>

Joseph A. Cook

Joseph A. Cook is an unauthenticated and unverified agent name

Extended Specimens and Standardized Data:

Using standardized, predictable data to form resolvable, reciprocal links to related internal and external data objects



UAM:Mamm:94705

Marmota caligata

(same individual as) **MSB:Mamm:247082**

family@2019-05-22: Sciuridae
identification@2019-05-22: *Marmota caligata*

(host of) **MSB:Para:25540**

family@2019-05-10: Oxyuridae
identification@2019-05-10: *Citellina caligata*



Connecting Research and Researchers

Collector(s)

Joseph A. Cook, Stephen O. MacDonald, Natalie G. Dawson, Anson Koehler

Attributes

sex: female
Stephen O. MacDonald, 2004-07-15
Std. Meas.

| total length | tail length | hind foot | efn |
|--------------|-------------|-----------|-------|
| 690 mm | 188 mm | 87 mm | 34 mm |

reproductive data: 4 plsc (3R,1L)
Stephen O. MacDonald, 2004-07-15

Determination Type: collection

assigned by Joseph A. Cook on 2004-07-15

Higher Geography: North America, United States, Alaska, Mt. Katmai Quad, Katmai National Park and Preserve

Specific Locality: Murray Lake

Collecting Source: wild caught

Event Date: 2004-07-15

Verbatim Date: 15-Jul-2004

Verification Status: unverified

Coordinates: 58.7666666667 / -154.9666666667

Verbatim Coordinates: 58d 46m 0s N/154d 58m 0s W

Datum: North American Datum 1927

Error: 2 mi

Georeference Source: USGS Map

Georeference Protocol: not recorded

| Part Name | Condition | Disposition | Count |
|------------------------|-----------|-----------------|-------|
| cestode (formalin) | unchecked | unchecked | 1 |
| feces (K2Cr2O7) | 4 | on loan | 1 |
| liver (frozen) | 4 | unchecked | 1 |
| liver (frozen) | 4 | unchecked | 1 |
| liver (frozen) | 4 | unchecked | 1 |
| nematode (70% ethanol) | good | being processed | 1 |
| skeleton, postcranial | complete | in collection | 1 |
| skin, flat | good | in collection | 1 |
| skull | complete | in collection | 1 |



Identifiers [collapse]

GenBank: KJ458372
GenBank: KJ457965
GenBank: KJ457779
GenBank: KJ457606
GenBank: KJ457428
GenBank: KJ458135
NK: 122917



U. S. National Park Service accession: KATM-00330
U. S. National Park Service catalog: KATM 41326

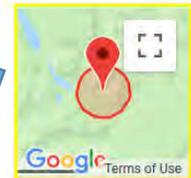


image (image/jpeg)
Media Details



image (image/jpeg)
Media Details
Arctos Data Ownership and...

MORPHOBANK
HOMOLOGY OF PHENOTYPES OVER THE WEB

Citations

voucher of *Marmota caligata*, page 824 in Kerhoulas et al. 2015 DOI:10.1093/jmammal/gyv089
voucher of *Marmota caligata* in Winer et al. 2017 DOI:10.1016/j.jcpa.2016.10.005



It's not dead if it has DATA

With Gratitude to:

Everyone in the **Arctos Working Group**; special thanks to programmer **Dusty McDonald** for his thoughtful magic. Thanks to our partner **Texas Advance Computing Center, TACC**

Thanks to Workshop organizers for this great opportunity!

And thanks to all the technology partners that help form the informatics 'ecosystem'-- Crossref, GBIF, GGBN, Global Names, GLOBI, Google, iDigBio, NCBI, OpenCitations, ORCID, Species+, VertNet, Wikidata, Wikipedia, WoRMS, etc

References

Thiers, Barbara, Anna Monfils, Jennifer Zaspel, Elizabeth Ellwood, Andrew Bentley, Katherine Levan, John Bates, David Jennings, Dori Contreras, Laura Lagomarsino, Paula Mabee, Linda Ford, Robert Guralnick, Robert Gropp, Marcy Revelez, Neil Cobb, James Lendemer, Katja Seltmann and Mary Catherine Aime. 2019. *Extending U.S. Biodiversity Collections to Promote Research and Education*

